FITZWILLIAM NATURAL RESOURCES INVENTORY

2009

Table of Contents

Purpose and Scope of Study

At the Town Forum of 2006, residents of Fitzwilliam selected a new Natural Resources Inventory as a first step in developing a plan to preserve the rural features of the town. The plan was a top priority.

Steeply rising population figures at the end of the 20th century and development in neighboring towns warn that we must have a vision of what we want to preserve and take action to insure that what we love about Fitzwilliam endures.

A Natural Resources Inventory begins as a listing and mapping of the natural features of the town, including wetlands, aquifers, soils, wildlife, habitats, views, and conservation lands. These data provide a basis for natural resources conservation, and they can be used by the town to evaluate the environmental value of various parcels, aid in land-use decisions, and protect essential surface waters, aquifers, and soils. The goals of this report are (1) to define and record the town's natural resources and (2) to outline a plan for their protection.

Fitzwilliam's ecosystems were here long before humans arrived. The town will likely grow, but by planning growth in areas that do not heavily impact natural resources, soil and water are protected for future generations. In the process, the natural beauty of Fitzwilliam will be preserved while retaining a healthy environment and a vital community.

Overview of Natural Resources Inventories

The New Hampshire Planning and Land Use Regulations, RSA 36-A:2, tasks town Conservation Commissions with keeping an index of all its open space and natural, aesthetic, and ecological areas within a town. A Commission may recommend to the Selectmen and the Planning Board a program for the protection, development, or better utilization of all such areas. This Natural Resources Inventory meets that directive.

The inventory is designed to be a tool for the town to use. As shown in the Table of Contents, sections 5 through 9 comprise a list of all the natural resources included in the Natural Resources Inventory. Each of those sections is organized as follows:

1) definition of the environmental feature(s)

2) description of its ecological importance
3) description relative to Fitzwilliam
4) recommendations
5) map(s) locating the feature in Fitzwilliam
6) sources of data and information

In short, the Natural Resources Inventory presents a current picture of Fitzwilliam while looking to the future.

The Fitzwilliam Natural Resources Inventory Committee

The Natural Resources Inventory Committee was formed at the conclusion of the Fitzwilliam Community Forum in May 2006. Its task was to create a new Fitzwilliam Natural Resources Inventory, per RSA 36-A:2. The Committee began monthly meetings, and in September 2006, it became an official subcommittee of the Fitzwilliam Conservation Commission in order to establish lines of authority and acquire funding.

RSA 36-A:2 Conservation Commission. – A city or town which accepts the provisions of this chapter may establish a conservation commission, hereinafter called the commission, for the proper utilization and protection of the natural resources and for the protection of watershed resources of said city or town. Such commission shall conduct researches into its local land and water areas and shall seek to coordinate the activities of unofficial bodies organized for similar purposes, and may advertise, prepare, print and distribute books, maps, charts, plans and pamphlets which in its judgment it deems necessary for its work. It shall keep an index of all open space and natural, aesthetic or ecological areas within the city or town, as the case may be, with the plan of obtaining information pertinent to proper utilization of such areas, including lands owned by the state or lands owned by a town or city. It shall keep an index of all marshlands, swamps and all other wet lands in a like manner, and may recommend to the city council or selectmen or to the department of resources and economic development a program for the protection, development or better utilization of all such areas. It shall keep accurate records of its meetings and actions and shall file an annual report which shall be printed in the annual town or municipal report. The commission may appoint such clerks and other employees or subcommittees as it may from time to time require.

Acknowledgements

David Ashenden. Metropolitan District Commission (MA), Geologist

Citizens of Fitzwilliam. (Wildlife, Forest, Plants—2007 and 2008 surveys)

Debbie Favreau. Fitzwilliam Administrative Assistant

Fitzwilliam Conservation Commission members:

Daniel Bemis, Robert Corrette, Cheryl Davis, Barbara Green (Vice Chair), Paul Kotila (Chair), Fred Slavic, Rosalind Slavic, Dorothy Zug

Steve Froling. Hancock Conservation Commission

Sandra Gillis. Fitzwilliam Land Use Administrative Assistant

Heidi Holman. New Hampshire Department of Fish and Game

Susan Massin. Fitzwilliam Librarian

Natural Resources Inventory Committee members:

Barbara Green, Jean Ibelle, Paul Kotila, Nicholas Noyes (Secretary), Carol Ann Rocheleau, Andrew Walters, Dorothy Zug (Chair)

Terri Sillanpaa. Fitzwilliam Historical Society

Kate Thomas. Fitzwilliam Assistant Librarian

Paula Thompson. Fitzwilliam Town Administrator

Photography: Frank Bateman, Paul Grasewicz, Nancy and Warren Hall, Chris Holman, Douglas A. Ibelle, Jean Ibelle, Carol Ann Rocheleau, Oliver and Jacquie Taylor

All maps: NH GIS Data & Metadata (n.d.). Retrieved 2008, from NH GRANIT, http://www.granit.unh.edu/.

Fact Sheet for Fitzwilliam, New Hampshire

The town of Fitzwilliam is located in the Southwestern part of New Hampshire in an area known as the Monadnock Region. It is hilly, forested country dominated by Grand Monadnock (3,165 ft.) in neighboring Jaffrey. One can see that peak from many spots in town, and the climb up Little Monadnock (1,883 ft.) is rewarded with an impressive view of Grand Monadnock.

Location: Cheshire County, New Hampshire. Latitude: 42°42'30"- 42°47'40"N, Longitude: 72°5' - 72°14'W.

Size: Approximately 23,360 acres or 36.5 square miles.

Population: estimated to be 2,292 in 2009.

Transportation: 75 miles of roads, 64 miles of which are approved public streets, maintained either by town or state. These include 15.7 miles of state highways and 48.6 miles of town maintained roads. About 10.5 miles of road are not maintained. These Class VI roads are not approved public roads, although they are right-of-ways.

Adjoining Towns: Troy, NH; Richmond, NH; Royalston, MA; Winchendon, MA; Rindge, NH; Jaffrey, NH.

Topography: The town varies in elevation from approximately 885' above sea level at Sip Pond in the south to 1,883' at the top of Little Monadnock in the northwest corner. The terrain is generally higher and more rugged along the western and northern boundaries. Most of the surface waters drain to the south via Kemp, Scott, and Priest Brooks to the Millers River in Massachusetts.

Climate/Weather: Average Temperatures: January, 20° F; July, 69° F. Average Precipitation: 37.2" annually.

Geology: Bedrock of fine-grained Fitzwilliam granite in eastern three quarters of town; rusty schists and granulites to the west.

Watersheds: Principal watershed is the Connecticut River. Secondary watersheds include Ashuelot River, Tully Brook, Scott Brook, Tarbell Brook, Priest Brook, and Kemp Brook.

Water Bodies: Laurel Lake, Sip Pond, Scott Pond, Bowker Pond, Collins Pond, Rockwood Pond, Sportsman Pond, and Stone Pond. Undocumented, but locally known: Boyce (Horseshoe) Pond and Children's Pond.

Wetlands: Approximately 2,000 acres of wetlands, including bogs, marshes, and swamps.

Forests: Mostly second and third growth of mixed hardwood, white pine, and hemlock. Red maple, red spruce, balsam fir, and tamarack occur in wetter areas.

Land Use: Residential (improved and unimproved), 5,757+ acres; Commercial, 90+ acres; Industrial, 40+ acres; Recreational Uses, 550+ acres; Agriculture, 175 acres; Institutional, including churches, schools, and cemeteries, 35 acres; Governmental, 5+ acres; Roads and Highways, 500 acres.

Land Protection: Current use, 13,748 acres; Rhododendron State Park, 294 acres; top of Little Monadnock Mt., 277 acres; Conservation easements, 471 acres; Town lands, 369 acres.

Resources

Avitar of New England, Inc. 2008. Land use in Fitzwilliam. (www.avitarofneinc.com).

Fitzwilliam Conservation Commission. 1996. Inventory of the natural resources of the town of Fitzwilliam 1996. Fitzwilliam, NH.

New Hampshire Department of Revenue Administration. 2008. Summary inventory of valuation form, MS 1, Fitzwilliam, NH. Concord, NH.

US Census Bureau. 2008. Fitzwilliam census information. (http:/factfinder.census.gov).

Overview of Town History

"The first settlers to arrive in Fitzwilliam were Mr. & Mrs. Benjamin Bigelow. They traveled from Lunenburg, Massachusetts over the French & Indian War Military Road to Monadnock #4 or Stoddardtown early in the year of 1762, ten years after the charter was granted." (Fitz. Con. Com., p. 5).

In March of 1773 the settlers and proprietors of Monadnock No. 4 met to discuss incorporating the area into a township. A petition was submitted to the Governor of the Province of New Hampshire, John Wentworth, and he granted it in the name of King George III, on May 19, 1773. He named the town after his friend the Earl of Fitzwilliam (Norton, pp. 147-151). The first meeting of the newly incorporated town was held in March 1774.

The stone walls that now seem graceful were not a matter for discussion in the early records of the town. Even so, the minutes of that first March meeting reflect their importance. "Voted and choose [*sic*] Nathaniel Wilder and John Fassett fence vewers [*sic*]" (Norton, p. 153). Fence viewers were required by law to assess the adequacy of a farmer's fencing (Allport, pp. 42-45). At first fences were fashioned of brush and stumps, but as the land was cleared, readily available wood disappeared, and so stone became the fence building material of necessity (Allport, pp. 35-40). Fortunately, "the town is noted for the super abundance of its stones, rocks, bowlders [*sic*], and ledges" (Norton, p. 18). New England's era of stonewall building was from 1775 to 1825 (Allport, p. 89). One factor contributing to this phenomenon was the growing commercial value of sheep (Allport, p. 92).

The cost of imported wool created demand at the local level. In all likelihood, Fitzwilliam farmers followed the trend in New England of raising more sheep to meet the demand. They were also encouraged by the arrival in 1811 of the Merino breed, which has a high fleece to animal weight ratio, and further encouraged by a tariff law passed by Congress after the war of 1812 to protect farm products (Allport, p. 92). Drovers used the main roads to drive sheep to markets, such as Boston, and "if you lived on one of them and wanted a front lawn, you had best put up a picket fence" (R. Corrette, personal communication, August, 2007).

Of equal economic value to the town were woodenware mills such as the Howe Mill and the Bowker Mill. They produced such items as clothespins, pails, buckets, and tubs. These goods were shipped by wagon all over New England and

into New York and as far away as New Jersey and Pennsylvania (West, p. 30). The railroad transported these goods to an even larger market. Some woodenware mills continued operations until metal replaced wood.

The Cheshire Railroad opened in 1848 (West, p. 30), making it feasible to quarry and ship the white granite. After the Civil War granite quarries operated in earnest. In 1886, 7,080 tons were shipped. At their peak in 1915 the quarries had over 300 workers on their payrolls (West, p. 36). R. L. Angier built a two-and-a-half story boarding house for his workers. In the Depot Village, G. Webb converted a warehouse into quarters for quarry workers and used it until 1930. The Depot grew in large part because of the quarries (Fitzwilliam Town, p.68). Stone from the Blodgett Quarry went to Albany; stone from the Webb Quarry to Cincinnati, Cleveland, Chicago, and St. Louis (Fitzwilliam Town, pp. 87, 89).

Local delivery of ice from Laurel Lake continued until the refrigerator replaced the icebox. On the east side of the lake Ed Dean filled his icehouse and made deliveries in Fitzwilliam and Troy. At the north end, Stephen White sold ice "along with milk and vegetables, around the lake from an old flat-bottomed boat." In proximity to the railroad tracks, it became profitable to cut, store, and sell ice to non-neighboring towns. At Stone's Mill Pond the Boston Ice Company built an icehouse, and the Fall River Ice Company had one at Sip Pond, which operated till 1905 (Fitzwilliam Town, p. 80).

Native high-bush blueberries thrive in the acid soil of Fitzwilliam. In the six-week season berrying was a way to boost the family income (Fitzwilliam: profile, p. 76). In the late 1800's crates went to Boston by train and in the early 1900's by car as well. Some referred to Fitzwilliam as the "Blueberry Capital of the World" (Fitzwilliam Town, p. 78).

In 1775 the population was 250, increasing to 1,038 by 1790. In 1815 Troy was incorporated taking about 4000 acres from Fitzwilliam and over 200 inhabitants. The population dropped from 1,301 in 1810 to 1,167 in 1820 (West, p. 23). It then rose to a 19th century peak of 1,482 in 1850. Population in the 20th century began at 987, and was 965 in 1960. By 1975 it had increased dramatically to 1,500 (est.) setting a new high since the town's incorporation. It then grew to 1,795 by 1980, and increased to 2,141 by 2000. The estimate for 2009 is 2,292, approximately 66 persons per square mile.

The early settlers and subsequent residents have passed down the town's natural resources to future generations for them to enjoy and maintain.

Resources

Allport, S. 1990. Sermons in stone. Norton Publishing, NY.
Economic and Labor Market Information Bureau. 2008. New Hampshire employment and business information. Concord, NH.
Fitzwilliam Conservation Commission. 1996. Inventory of the natural resources of the town of Fitzwilliam 1996. Fitzwilliam, NH.
Fitzwilliam Town History Committee. 1985. Fitzwilliam: the profile of a New Hampshire town, 1884-1984. Phoenix Publishing, NH.
Norton, J. F. 1888. The history of Fitzwilliam, New Hampshire, from 1752 – 1887. Burr Printing House, NY.
West, R.G. 1976. The story of Fitzwilliam. Fitzwilliam, NH.

Geology and Topography

Geology

Bedrock

The bedrock in Fitzwilliam is composed of metamorphic and igneous rock formed 420 to 360 million years ago.

The bedrock underlying the western edge of town (and from Sip Pond south) is in the upper (younger) part of the Rangeley Formation, dating back to the lower (older) Silurian period. It is a gray, thinly laminated metamorphic rock. Because of the iron in these rocks, they can appear rusty, and wells drilled into this bedrock are apt to have a high iron content.

On the western edge of town, but more to the south, is bedrock of Spaulding Tonalite formed in the New Hampshire plutonic series in the lower (older) Devonian period. Tonalite is a grey igneous rock, composed mainly of quartz and feldspar.

The bedrock in the central and eastern parts of Fitzwilliam is the binary granite for which the town is famous, a fine grained and light-gray to white igneous rock. It was formed in the New Hampshire plutonic series in the upper (younger) Devonian period. The Concord Granite in Fitzwilliam is distinguished by having a low percentage of iron.

In the southeast corner the bedrock is Kinsman Granodiorite, dated from the lower (older) Devonian period. The quartz in it makes it like granite, but it is coarser and darker, sometimes speckled with mica crystals and white feldspars.

The Paleozoic Era lasted from 570 to 248 **m**illion years **a**go (**ma**). Those 322 million years are sometimes subdivided as shown in the table below. Fitzwilliam's best-known bedrock was formed in the Devonian period.

P a l e o z o i c E r a 570 – 248 **m**illion years **a**go (**ma**)					
Lower Paleozoic			Upper Paleozoic		
Cambrian 570 - 510 ma	Ordovician 510 - 439 ma	Silurian 439 - 409 ma	Devonian 409 - 363 ma	Carboniferous 363 - 286 ma	Permian 286 - 248 ma

Bedrock listed in chronological order (from oldest to youngest)--

Lower Silurian -- Rangeley Formation
Lower Devonian -- Kinsman Granodiorite
Spaulding Tonalite
Upper Devonian -- Concord Granite

Surficial Deposits

The retreating ice of the Wisconsin glacier age, only 20-10 thousand years ago, left deposits of sand and gravel, notably along Kemp Brook and near Priest Brook on the Massachusetts border. It also left erratics (rocks transported by a glacier and deposited on bedrock of different composition) and plenty of rocks for building stone walls. Both walls and erratics are evident on any woods-walk in town.

Topography

Fitzwilliam can be characterized as having a hilly topography with extensive areas of low wetlands. Altitude varies from a high of 1,883 feet (576 m) at the top of Little Monadnock Mountain to a low of 885 feet (270 m) where Priest Brook enters Winchendon, Massachusetts, and Tarbell Brook enters Royalston. Little Monadnock offers the steepest climb in town with a 20% slope (rise over run).

Complete topography of Fitzwilliam can be found on the U.S.G.S. 7.5'xl5' quadrangles of Mt. Monadnock, NH (1984), and Winchendon, MA (1988).

Resources

Anon. 2008. Rocks & Minerals. (http://mineral-rock.blogspot.com/2008/12/rocks.html, retrieved Sept 2008)

Anon. 2008. Timeline of glaciation. (http://en.wikipedia.org/wiki/Timeline_of_glaciation, retrieved Sept 2008)

Anon. 2008. Paleozoic Era. (http://library.thinkquest.org/20886/Paleozoic.html, retrieved, Sept 2008)

Billings, M. P. 1956. The Geology of New Hampshire: Part II—Bedrock Geology. New Hampshire State Planning and Development Commission, Concord.

Fitzwilliam Conservation Commission. 1996. Inventory of the natural resources of the town of Fitzwilliam 1996. Fitzwilliam, NH.

Goldthwait, J. W., Goldthwait, L., & Goldthwait, R. P. 1951. The Geology of New Hampshire: Part I—Surficial Geology. New Hampshire State Planning and Development Commission, Concord.

New Hampshire GRANIT. 2008. Map database. (http://www.granit.unh.edu/)

Soils

The following is taken from the 1996 Natural Resources Inventory of the Town of Fitzwilliam.

Soils are a combination of mineral material originating from rock and organic material produced by plants. The type of soil that develops in an area is dependent on five factors-the climate (principally moisture and temperature), parent material, plant and animal life, topography (land slope), and time. The parent material is the unconsolidated material in which soil forms. In Fitzwilliam this is glacial till, unsorted debris of sand, gravel, and rocks, deposited by the last glaciation of some 12,000-14,000 years ago.

Physical and chemical weathering by water and freezing and thawing have broken down these materials and leached some of them away. The development of plant communities on this material further changes the soil. Organic material, in the form of leaves and branches, decays to form the dark surface layers of local soils. This material also contributes acids to the soil that further weather and leach the soil. Microbes, earthworms, and other soil organisms act to further decay organic material, aerate and mix the soil layers.

The slope (topography) of the land also plays a role since it determines the flow of water and the deposition of eroded materials. The moderate slopes of Fitzwilliam typically have well drained, distinctly layered soils that reflect the leaching that has taken place as water has flowed through the soil and downslope. Soils in the bottoms of valleys, however, are often saturated with water and high in undecayed organic material, reflecting the poor drainage and lack of oxygen. Over time these processes, acting continuously together, have created the soils that we see today in Fitzwilliam.

Most of Fitzwilliam is characterized by a type of soil association called "Monadnock-Tunbridge." A soil association is designated on the basis of the major types of soils found in the area. Monadnock-Tunbridge is characterized as "very deep and moderately deep, gently sloping to very steep, well drained loamy soils that formed on glacial till" (Rosenberg, 1989). This means that Fitzwilliam has generally well developed soils found on moderate to steep slopes that have developed over unsorted glacial deposits. Loamy soils, consisting of a mixture of clay, silt, and sand, are generally considered the best for supporting plant growth.

These soils would normally support forest vegetation in Fitzwilliam.

A small portion of town, bordering Troy and Jaffrey, falls in the "Berkshire-Tunbridge-Lyman" soil association, characterized by "very deep and moderately deep, gently sloping to very steep, well drained and somewhat excessively drained, loamy soils that formed in glacial till" (Rosenberg, 1989).

Although Fitzwilliam soils can be generalized in this way, the actual composition of soil varies greatly from place to place in town. Fitzwilliam soils thus range from water-saturated wetland soils to very well drained sands and gravels. Although a quite detailed, recent soil map is available for Cheshire County (see Rosenberg, 1989), even these maps provide only a general characterization of soils at any specific location within the town. Care must be taken in using soils maps to determine the soil characteristics at specific sites. Soil characteristics have significant impacts on a number of natural as well as human uses of the land. Soils, for example, are both affected by and reflective of the natural vegetation cover they support. Wetland plants, such as cattails and sedges, are adapted to the saturated, mucky soils wetlands contain. Upland forests of pine and hemlock, on the other hand, require deep, well-drained soils. These differences in vegetation in turn influence the types of animal communities present.

Similarly, human uses of land often depend on soil type. The shallow organic layers of many Fitzwilliam soils, although adequate for forests, make it difficult to support high intensity agriculture without great care or supplemental fertilizers. Roads built on poorly drained soils are notorious for winter frost heaves that develop when water in the soil freezes and expands. High-clay soils are unsuitable for septic systems since they impede water movement and prevent decay of waste because of inadequate oxygen. Soils that drain too rapidly, on the other hand, can lead to contamination of ground water if septic leach fields do not retain sewage long enough to be decayed. These and other soils characteristics are thus important consideration in siting of buildings and the development of zoning regulations. P.K.

The following definitions are taken from the Soil Attribute Data Dictionary for use with the Soils map in this section.

Prime Farmland soils:

a. have an aquic or udic moisture regime and sufficient available water capacity within a depth of 40 inches to produce the commonly grown cultivated crops adapted to New Hampshire in 7 or more years out of 10.

b. have a pH between 4.5 and 8.4 in all horizons within a depth of 40 inches.
c. have either no water table or have a water table that is maintained at a sufficient depth during the cropping season to allow cultivated crops common to New Hampshire to be grown.
d. are not frequently flooded during the growing season (less than a 50% chance in any year or the soil floods less than 50 years out of 100).
e. have a permeability rate of at least 0.06 inches per hour in the upper 20 inches.
f. have less than 10 percent of the upper 6 inches consisting of, rock fragments larger than 3 inches in diameter.

Farmland of Statewide Importance: not prime or unique but is considered farmland of statewide importance for the production of food, feed, fiber, forage and oilseed crops. Soils of statewide importance:

a. have slopes of less than 15 percent.
b. are not stony, very stony, or bouldery.
c. are not somewhat poorly, poorly, or very poorly drained.
d. are not excessively drained soils developed in stratified glacial drift, generally having low available water holding capacity.

Farmland of Local Importance: not prime, unique or of statewide importance, but has local significance for the production of food, feed, fiber, and forage. Criteria for the identification and delineation of local farmland in Cheshire County are:

a. soils that are poorly drained, have artificial drainage established, and are being farmed.
b. specific soil map units identified from the NRCS county soil survey legend, as determined by the Conservation District Board.

Resources

Fitzwilliam Conservation Commission. 1996. Inventory of the natural resources of the town of Fitzwilliam 1996. Fitzwilliam, NH.

Natural Resources Conservation Service. 2002. New Hampshire soil attribute data dictionary. (http://www.nh.nrcs.usda.gov/Soil_Data/attribute_data/cheshire.html, retrieved May 06, 2008)

Rosenberg, G. L. 1989. Soil survey of Cheshire County New Hampshire. USDA, Soil Conservation Service. p. 262.

Ground and Surface Waters

Groundwater

Most Fitzwilliam residents and businesses depend on groundwater for their water supplies. Groundwater is water beneath the surface of the land that does not come in contact with the air. The word "aquifer" is used to describe earth materials that are saturated with water and from which a water supply can be obtained.

Groundwater aquifers can be found in three types of earth material: stratified drift, till, and bedrock. Stratified drift and till are unconsolidated materials deposited by glaciers while bedrock is solid rock. Stratified drift consists of sorted and layered unconsolidated material, such as sand and gravel, while till is made up of mixtures of different particle sizes that are not sorted or layered.

The stratified drift aquifers of Fitzwilliam were surveyed by the U.S. Geological Survey (USGS; Moore et al., 1994), and these aquifers have been mapped. The largest of these areas extend around the middle portion of Kemp Brook and southeastward from Sip Pond. Smaller areas are found around Rockwood Pond, Bowker Pond, Scott Brook, Sportsmans Pond, Laurel Lake, and along the Templeton Turnpike.

The transmissivity has also been determined for all but the two largest Fitzwilliam stratified drift aquifers. Transmissivity is the ability of an aquifer to transmit water through it. Aquifers with high transmissivity are most likely to be able to supply large volumes of water for extended periods of time. All of Fitzwilliam's stratified drift aquifers that have been surveyed have low to moderate transmissivities. No measurements have been made on the two largest stratified drift aquifers in town, however.

Groundwater is often regarded as mysterious because it is largely unseen. Where the groundwater comes from and where it goes are not evident at the surface, and often even hydrologists who study these water supplies are unable to precisely say what groundwater is doing. There is little doubt, however, that groundwater ultimately originates at the surface of the earth and then flows, under the pull of gravity, downward to recharge the aquifers. This recharge may be direct, coming from the land directly above the aquifer, or indirect, flowing via some other route beneath the surface.

Groundwater, however mysterious, can be depleted if withdrawal exceeds recharge. Many well-users are familiar with this principle when their well goes dry during an extended dry spell when their use (withdrawal) has exceeded the recharge. Likewise, because most groundwater originates at the surface, it can be contaminated by accidental spills, leaking underground tanks or landfills, road salts, or any of a number of chemicals. Because polluted groundwater is so difficult to clean up, it is extremely important that groundwater sources be identified and protected against contamination. Fitzwilliam is fortunate in knowing where its major stratified drift aquifers are located (the same can be said for its bedrock supplies) and to have relatively few potential sources of contamination.
P.K.

Surface Waters

Almost all of the surface waters of Fitzwilliam originate within the town borders. Only a small northern portion of the Scott Pond drainage originates outside of town in Troy, N.H. Thus the potential for contamination of surface water rests largely within Fitzwilliam itself.

Except for the Bowker and Rockwood Pond drainages, which drain to the north, all Fitzwilliam watersheds drain to the south. The western slopes drain out of town to the southwest and eventually enter Tully Brook. The Kemp Brook drainage, including Laurel Lake, drains most of the western quarter of the town. The Scott and Priest Brook drainage, beginning north of the town in Troy, completely bisects Fitzwilliam, carrying water through Scott and Stone Ponds. The Sip Pond drainage includes most of the eastern part of town, draining to the southeast. A small portion of the northeastern corner of town drains into the Pearly Pond watershed in Rindge, N.H.

All of these watersheds eventually find their way to the Connecticut River. Bowker and Rockwood Ponds feed the south branch of the Ashuelot River. Tully Brook, Scott Brook, Priest Brook, and Sip Pond Brook eventually join the Millers River in Massachusetts.

Eight named lakes and ponds, for which there is recorded data, are found within Fitzwilliam. They range in size from 20 acres (Stone Pond) to 155 acres (Laurel

Lake) and range in depth from less than 10 feet (Scott, Sip, Sportsman) to nearly 48 feet (Laurel Lake). Except for Sip and Collins Ponds, all are natural lakes and ponds that have been raised by manmade dams.

Water quality conditions of the lakes and ponds range from the very clear, low nutrient characteristics of Laurel Lake to the more tea-like color and higher nutrient conditions found in Scott, Sip, and Bowker Ponds. All of the ponds are acidic and have a low acid neutralizing capacity (ANC). The latter means these lakes do not have a high ability to neutralize acid that may originate from acid precipitation. There are no current water quality data for several of the ponds (see table).

Based on information collected by the New Hampshire Department of Environmental Services, Fitzwilliam lakes are currently classified as oligotrophic (Rockwood and Laurel), mesotrophic (Collins), or eutrophic (Bowker, Scott, Sip, & Stone). Oligotrophic lakes are generally characterized by low phosphorus concentrations, clear water, low algae and rooted plant populations. Eutrophic lakes have high phosphorus concentrations, less transparent water due to the abundance of algae and many rooted plants in shallow waters. Mesotrophic lakes are intermediate in these conditions.

All of the Fitzwilliam lakes and ponds, except Collins, Sportsman and Stone, have public access. Laurel Lake is the most heavily used for boating and has the most intensely developed shoreline. The small town beach is located at the south end of the lake. The water quality of Laurel Lake and Rockwood Pond is currently being monitored by volunteers who participate in the New Hampshire Department of Environmental Services (NHDES) Volunteer Lake Assessment Program (VLAP). The Annual Reports are available on the DES website. Laurel Lake Association members also participate in the NHDES Volunteer Weed Watchers Program.

Except for Laurel Lake, all of the town water bodies are relatively shallow and support only warm water species of fish, including horned pout, chain pickerel, bass, sunfish, and yellow perch. Laurel Lake is the only lake deep enough to remain cold in its deepest waters during the summer and thus be able to support trout. Scott, Sip, and Bowker Ponds have extensive weed beds in the summer that severely limit recreational use of these ponds.

Since 1991, the surface waters of New Hampshire have been classified by the state legislature (RSA 485-A:8) as either Class A or Class B. Class A waters are considered to be of the highest quality and considered optimal for use as water

supplies after adequate treatment. Sewage discharges are prohibited in these waterbodies. Class B waters are considered acceptable for fishing, swimming, and other recreational purposes, and for use as water supplies after adequate treatment has been applied. Fitzwilliam's lakes and ponds are classified as Class B, as is most surface water in New Hampshire.

The state of New Hampshire recognizes a number of natural and raised dams, both active and inactive. The NHDES Dam Bureau regulates all dams in the state, whether privately or publicly owned, and balances the interests of all parties. The majority of dams in New Hampshire (78%) are owned by the owners of the properties on which they are located. On page 26 is a list of dams located in Fitzwilliam showing ownership, if known, and hazard classification.

Resources

Fitzwilliam Conservation Commission. 1996. Inventory of the natural resources of the town of Fitzwilliam 1996. Fitzwilliam, NH.

New Hampshire Department of Environmental Services Dam Bureau. 2009. Dams in Fitzwilliam. Concord, NH. (http://des.nh.gov/organization/divisions/water/dam/index.htm)

NHDES Volunteer Lake Assessment Program. 2008. Water quality of Fitzwilliam lakes and ponds. Concord, NH. (http://des.nh.gov/organization/divisions/water/wmb/vlap/index.htm/)

NHDES Volunteer Weed Watcher Program. 2009. Records of native and exotic aquatic weeds in Fitzwilliam lakes and ponds. Concord, NH. http://des.nh.gov/organization/divisions/water/wmb/exoticspecies/weed watcher.htm)

NHDES List of Fitzwilliam Dams

Dam#	Haz Class	Status	Dam Name	Dam Owners
084.01	L	Active	Rockwood Pond Dam	Soc. for the Preservation of Rockwood Pd.
084.02	S	Active	Bowker Pond Dam	Meadowood County Area Fire Dept.
084.03	L	Active	Scott Pond Dam	Mr. Richard Bullock
084.04		Ruins	Collins Pond Dam	Unknown
084.05		Ruins	Round Boulders Dam	Unknown
084.06	L	Active	Stone Pond Dam	Orwell Pond Inc.
084.07	NM	Active	Laurel Lake Dam	Fleur De Lis Camp
084.08		Ruins	Meadow Pond Dam	Unknown
084.09		Ruins	Lower Scott Brook Dam	Unknown
084.10	NM	Active	Damon Mill Dam	Brian Damon
084.11		Ruins	Upper Scott Brook Dam	Unknown
084.12	L	Active	Boyce Pond Dam	Mary & George Wons
084.13	L	Active	Sportsman Pond Dam	Associated Sportsmans Club Inc.
084.14	NM	Active	Farm Pond Dam	Ms. Ruth Chase

Key to Hazard Class

NM	Non-Menace	Certain height & storage criteria; inspection every 5 years; no annual dam registration fee (ADRF)
L	Low	Inspected every 5 years - $400. ADRF
S	Significant	Inspected every 2 years - $750.ADRF
H	High	Inspected every year - $1,500. ADRF

Data Summary for Fitzwilliam Lakes and Ponds

	Bowker Pond	Collins Pond	Laurel Lake	Rockwood Pond	Scott Pond	Sip Pond	Sportsman Pond	Stone Pond
Surface Area Acres	44	30	155	76	134	118	137	20*
Watershed Area Acres	-	33	768	832	3,966	3,027	5,085	6,372
Elevation Ft.	1,170	1,070	1,099	1,111	1,073	884	1,000	1,035
Impoundment Class	Natural/ Raised	Natural	Natural/ Raised	Natural/ Raised	Natural/ Raised	Natural	Natural/ Raised	Natural/ Raised
Dam Maintenance	Meadowood County Fire Dept.	no dam	Fleur De Lis Camp	Soc. for Preservation of Rockwood Pond	Bullock	no dam	Sportsman Club Inc.	Orwell Pond Inc.
Depth Max Ft.	8.9	10.2	47.9	22.0	8.5	7.9	9.8	4.6
Depth Mean Ft.	2.6	4.6	20.0	10.5	2.3	5.9	-	1.6
Public Access	Yes	No	Yes	Yes	Yes	Yes	No	No
Lake Association	No	No	Yes	Yes	No	No	Yes	No
Aquatic Plants	Abundant	Common/ Abundant	Sparse	Sparse	Very Abundant	Very Abundant	- -	Abundant
Trophic Class	Eutrophic	Mesotrophic	Oligotrophic	Oligotrophic	Eutrophic	Eutrophic	(likely Eutrophic)	Eutrophic
pH	4.8	6	6.35	6.0	5.4	-	-	5.4
ANC mg/L	-0.3	1.7	2.00	1.0	0.2	-	-	1.7
Total phosphorus mg/L	0.024	0.007	0.007	0.029	0.016	0.017	-	0.043
Apparent Color (CPU)	55	12	~6	35	70	40	-	250
Secchi Depth Ft.	6.6	3.1 (bottom)	18.6	9.2	4.9	7.2	-	2.3
Chlorophyll- a mg/L	7.80	1.82	2.28	4.31	10.22	1.54	-	1.04
Year of Survey	1987	1998	2008	2008	1997	2007	-	1991

Data Sources: NHDES Trophic Surveys (Bowker, Collins, Scott & Stone); National Lakes Assessment (Sip); NHDES VLAP (Laurel Lake & Rockwood Pond)

* Stone Pond has been significantly reduced in size as a result of dam removal.

Potential Contamination Sources

The development of a variety of technologies has produced chemicals that do not normally occur in the environment or only occur in very small concentrations. Many of these materials can be hazardous. Human activities involving the use, distribution, and storage of such materials create conditions that can lead to unwanted and unhealthy introduction of these materials into the environment.

Improper disposal of hazardous materials from households, automotive repair shops, or small businesses can lead to contamination that is hard to clean up. The long-term storage of cars and trucks in junk yards poses a threat of leaking contaminants into the soil, water, and air. Underground chemical and fuel storage poses a potential threat to wells and groundwater.

It is essential to remain vigilant about the long-term storage or disposal of such hazardous waste materials and take stringent measures to prevent their escape into the environment.

Recommendations

- Maps of hazardous waste sites in the town should be updated regularly.
- State and other funds should be sought to assist small businesses and owners of land where old, now defunct, businesses stored or used potentially hazardous waste. Brown-fields cleanup funds are available for such projects.
- Based on scientific information about the rate of deterioration of storage containers or the location of other contaminants, a timeline for removal of hazardous materials at each site should be established in cooperation with the landowner.
- The town should work with state and federal agencies to sample and test suspected sources of contamination.

Resources

Fitzwilliam Conservation Commission. 2001. Ten year conservation master plan for Fitzwilliam, NH.

New Hampshire Department of Environmental Services. 1988. Groundwater protection plan for the town of Fitzwilliam. Concord, NH.

Planning for Fitzwilliam Open Space

Introduction

New Hampshire's population is growing twice as fast as the rest of New England, and this rapid growth is projected to continue. Between 2000 and 2025, New Hampshire is expected to grow by 358,000 people, more than 28%. Although most of the state's population growth continues to be absorbed by the southeastern counties, projections show this growth moving westward.

As population densities rise, New Hampshire is being transformed from a largely rural state to a predominantly urban and suburban one. By 2025, rural New Hampshire is expected to be restricted to the North Country and isolated pockets in the west.

Closer to home, the Monadnock region's population growth is projected at 21% between 2000 and 2020. Open space will continue to decline, with remaining undeveloped land becoming increasingly valuable. Open space may never be more affordable than it is today.

Both the 2007 Community Forum and the 2007 town-wide Master Plan Implementation Survey conducted by the Planning Board clearly show town residents value the rural character of Fitzwilliam. It is important that Fitzwilliam initiate a comprehensive plan for maintaining open space, preserving its rural character, and planning for appropriate development. One major step in this process is the creation of a town open space plan.

The Natural Resources Inventory

This Natural Resources Inventory provides the basis for an open space plan. It provides documentation of the town's natural features, including lists of species, habitat maps, and identification of areas yet undeveloped. Such a compilation, however, does not by itself identify which open spaces in Fitzwilliam should be preserved. That task will be the responsibility of the Open Space Committee.

Evaluating Potential Conservation Areas in Fitzwilliam

While preparing the Natural Resources Inventory, the Committee developed a set of Conservation Guidelines to aid in identifying and quantifying the conservation values of property (see next section). These Guidelines provide a consistent list of land characteristics that enable comparisons to be made among different properties, as well as a basis for prioritizing potential conservation projects. The land characteristics contained in the Guidelines were developed after review of similar guidelines in other towns, review by town Selectmen, Planning Board and Conservation Commission members, the public, and some initial field testing. Together the Guidelines and characteristics can serve to focus efforts on developing an open space plan for Fitzwilliam. The major categories of conservation characteristics and the rationale for their inclusion in the Guidelines are described below.

Conservation Characteristics

Below are brief explanations of the characteristics useful in the evaluation of potential conservation lands in Fitzwilliam.

1. **Parcels that have a relationship to conserved land or have conservation values**.

Fitzwilliam is fortunate to have a large block of protected land in and around Little Monadnock Mountain, including the Slavic easement, Rhododendron State Park, the Widow Gage Town Forest, and abutting conserved land in neighboring Richmond. Adding to existing conserved land provides an opportunity to create the large unfragmented parcels that best provide for the maintenance of ecological diversity, recreation, and resistance to natural and manmade disruptions. Such parcels also present the best opportunities, where appropriate, for effective forest management and protection of many of the conservation values outlined below.

2. **Wildlife and Special Natural Areas**

Fitzwilliam still maintains a diversity of wildlife species, from its abundance of squirrels and turkeys to the occasional black bear. Maintaining these populations requires habitats of appropriate size and characteristics. While a

number of 500+ acre undeveloped blocks still exist in town, larger blocks are confined to the northwest corner of town near Little Monadnock State Park. When combined with adjacent blocks in Richmond and Troy this undeveloped area approaches 3,000 acres.

Fitzwilliam has a number of potential "special natural areas" that are as yet only poorly identified, including vernal pools, wood turtle and Jefferson salamander habitat, deer yards, and bogs. The New Hampshire Wildlife Action Plan identifies several areas of Fitzwilliam as habitats of statewide significance, including peat bogs.

3. Clean Water

Water is essential to all life. It provides sustenance, scenic beauty, and habitat diversity. Surface waters are attractive to a variety of residential and migratory birds and wildlife, provide recreational opportunities, and support fish, amphibian, and reptile populations. Subsurface water supplies (aquifers) are directly and indirectly connected to surface waters. Many Fitzwilliam wetlands and surface water bodies are associated with stratified drift aquifers. Bedrock water sources, often the source of household or community well water, are less clearly associated with surface features, and the ultimate origin of such water may be very difficult to trace.

Unfortunately, the shorelines of lakes, ponds, and streams are often the first areas to be developed by humans. These shorelines are particularly important because they provide several habitats adjacent to each other - the water, the low shrubby margins, and the taller forests. The biodiversity along these shorelines supports a wide variety of mammals, birds, reptiles, amphibians, and plants. These areas can also be important wildlife corridors along which wildlife travel from one location to another. Such corridors are easily disrupted by high density development.

Wetlands (swamps, marshes, bogs) are areas of high water table that affect soil type and plant communities. They retain rain and melt water, help purify water as it percolates into the ground to recharge aquifers, and act as a sponge to store and slowly release water from peak flows. They support distinctive plants and animals that need moist conditions to survive. Vernal pools only fill with water in the spring and are a vital habitat for many amphibians as breeding spots.

4. Recreation, Scenery, Cultural and Historic Resources

Fitzwilliam offers many lakes, ponds, and streams for swimming, boating, and fishing. There is ample opportunity for hunting in the town. The grounds surrounding the Emerson School offer a major recreational area, including a playground, tennis courts, a pole barn for basketball, and the Charles Wallace sports field behind the school.

Fitzwilliam has a wealth of trails, including those on the Pinnacle north of Richmond Road, which has eight kilometers of groomed cross-country ski trails, plus the open hills for sledding and skiing which are also groomed. Rhododendron State Park and the discontinued railroad bed that bisects the town provide opportunities for hiking, biking, cross-country skiing, snowmobiling, and horseback riding. The Metacomet-Monadnock Trail crosses the Widow Gage Town Forest and Little Monadnock Mountain. Town trail maps are available at the library and town hall.

Scenic vistas are common in Fitzwilliam, whether across its many wetlands and ponds or from the peaks of Little Monadnock or the Pinnacle. Many views encompass Mt. Monadnock or Gap Mountain which are in adjacent towns. These views reinforce the rural, largely undeveloped impression of the town and provide a sense of space and natural habitat.

Fitzwilliam's historical character is self-evident in its town center, but its cultural heritage is widely distributed throughout town, in its many miles of stone walls, historic buildings and cemeteries, and abandoned quarries. These features provide a sense of continuity with the past and serve as obvious reminders of our human community.

5. Forestry and Agriculture

Soils, which reflect the climate of an area, determine the types of natural plant communities that can be supported. Most of Fitzwilliam's upland soils support forests of mixed tree species, many of which are commercially important. Prime agricultural soils are rare in Fitzwilliam, and only a small percentage of the land in town is actively farmed. Some of these soils, however, can be quite rich (e.g., Tracie's Farm on Old Jaffrey Rd.), and have the potential to support significant local agriculture.

6. Parcel Size

As indicated earlier, larger parcels of conservation land generally offer greater opportunities for maintaining natural communities, protecting water supplies, and minimizing adverse impacts. Whether properties are for recreation, sustainable forestry, or wildlife habitat, large parcels offer the best opportunities for maintaining a sense of open space in Fitzwilliam.

7. Possible Unwanted Features

Several conditions, often human created, can adversely affect the suitability of an area for conservation purposes. These factors need to be considered when evaluating potential conservation projects and setting conservation priorities for the town.

The Fitzwilliam Conservation Guidelines with their introduction and instructions follow this section.

Recommendations for the Next Steps for Open Space Planning in Fitzwilliam

The goal is to preserve and enhance the natural resources which give the Town much of its beauty and recreational opportunities, and which are essential to its ecological balance.

- Establish an Open Space Committee as a sub-committee of the Conservation Commission.
- Utilizing the Conservation Guidelines, identify and prioritize conservation areas of the town.
- Take a proactive stance toward acquiring easements and purchasing open space areas which have a high rating on the Conservation Guidelines.
- Work with adjacent towns to identify, create, and protect contiguous parcels of conserved lands.
- Continue to provide funds for the purchase of land or contributions toward conservation easements on private properties.
- Foster greater understanding of conservation easements.
- Preserve and enhance the rural character of Fitzwilliam by encouraging development designed to harmonize with the surroundings rather than

contradict them, and by examining ways to minimize strip development which erodes the rural character of an area.

- Sponsor "Root Out Days" to encourage removal of invasive species such as Japanese Knotweed.
- Support education programs.

Resources

Fitzwilliam Conservation Commission. 1996. Inventory of the natural resources of the town of Fitzwilliam 1996. Fitzwilliam, NH.

Fitzwilliam Conservation Commission. 2001. Ten year conservation master plan for Fitzwilliam, NH.

Hancock Conservation Commission Open Space Committee. 2003. Hancock, New Hampshire natural resources inventory.

Society for the Protection of New Hampshire Forests. 2001. New Hampshire everlasting, an initiative to conserve our quality-of-life. Concord, NH. (http://www.spnhf.org/pdf/nheverlasting.pdf)

Society for the Protection of New Hampshire Forests. 2005. New Hampshire's changing landscape. Concord, NH. (http://www.spnhf.org)

Southwest Region Planning Commission. 2005. Master plan for Fitzwilliam, New Hampshire. Keene, NH.

Guidelines for Assessing Conservation Lands in Fitzwilliam

Purpose and Introduction

The maintenance of open space, preservation of rural character and protection of the diversity of natural resources in the town of Fitzwilliam require that we identify characteristics of the landscape that we believe to be important. The purpose of these Guidelines is to provide a list of such characteristics and outline how town officials and residents can begin to compile information and make use of it in identifying locales that have important conservation attributes. This information can then be used by town officials and agencies to set priorities for land protection in town, document areas that may be sensitive to disturbance, and provide a basis for land use regulation that will facilitate wise use while protecting important town features.

These Guidelines rely on two important sources of information: 1) published and unpublished information sources, and 2) field survey work. Both are important in assessing the overall conservation value (not to be confused with the monetary value or price of a piece of property) of a locale or parcel of property.

Potential sources of information include:

- Topographical, Geological, Soil, Vegetation and Other Maps
- Aerial Photos
- Historical Documents
- Fish & Wildlife Records From Local, State and Federal Agencies
- Surveys and Records from Non-Profit Conservation Groups (e.g., Nature Conservancy)
- Natural Resources Inventories
- Personal Knowledge of Town Residents

Conservation Characteristics and A Conservation Index

The attached table provides a list of conservation attributes that town residents and the Conservation Commission have identified as important features of Fitzwilliam. The table is intended to provide a consistent list of land characteristics that will enable comparisons to be made among different areas or properties in the town.

The list also includes characteristics that may detract from the conservation value of a property (e.g., toxic contamination).

The Conservation Characteristics table also assigns values to each characteristic. These values are also based on the relative importance of each characteristic (higher value = more important) as determined by town residents, the Natural Resources Inventory Committee, and the Conservation Commission. By identifying which characteristics are present on a property and totaling these values it is possible to calculate a Conservation Index that can be used to give an over-all indication of important conservation characteristics. A high index value would be 22 and above; moderate index 11 – 21, and low index 10 or less.

The Conservation Characteristics table also provides a list of features that can be combined with other information (e.g., from maps) to write a summary description of the property. Such a summary should accompany any report from a field survey (see following guidelines).

Guidelines for Field Surveys

Field surveys can be conducted by individuals from a variety of backgrounds, regardless of expertise or prior experience. The goal is not to obtain expert data about a site but to begin a process of recording information that can be useful in determining the conservation characteristics that are present. In combination with information from other sources (e.g., maps), we can begin to better document the important natural features of Fitzwilliam. The steps in the field review process are listed below.

1) Obtain a map of the property that identifies property boundaries.
2) At least two people should visit the property, with the owner's permission, and complete the Conservation Characteristics worksheet, assigning points to the characteristics that are present.
3) As much of the property as possible should be visited. If all of the parcel is not covered, this should be noted on the comment sheet.
4) Notes should be kept about any characteristics and assignment of points that observers do not understand or are uncertain about.
5) Once the field visit is completed, total the points, and fill out the Comments sheet.

FITZWILLIAM LAND CONSERVATION CHARACTERISTICS

Worksheet

CRITERIA			POINTS
Section	**I.**	**Parcels with a Relationship to Conserved Land or Have Conservation Values**	
	A.	Land that abuts or provides linkages to existing conservation areas	6
	B.	Land threatened by a change in use that will undermine identified conservation values	3
	C.	Parcel has a clear potential to stimulate future contiguous land protection projects	3
	D.	Parcel is part of an unfragmented land area	3
		Section I Total Points	
Section	**II**	**Wildlife and Special Natural Areas**	
	A.	Large tracts of undeveloped habitat and corridors important for wildlife, often south-facing high slopes	3
	B.	Land containing ecologically significant or rare natural communities or species	6
	C.	Lands which increase the diversity and viability of wildlife populations, including fields and/or riparian areas	3
		Section II Total Points	
Section	**III**	**Clean Water**	
	A.	Land overlying aquifers and aquifer recharge areas	5
	B.	Frontage on named streams, lakes, and ponds, often important wildlife corridors	6
	C.	Wetlands, flood plains, vernal pools, small streams, and small ponds	3
		Section III Total Points	
Section	**IV**	**Recreation, Scenery, Cultural and Historic Resources**	
	A.	Land that offers opportunities for low impact outdoor recreation by the public	3
	B.	Parcels that preserve the town's cultural or historic heritage, such as granite quarries	3
	C.	Parcel is an important focal point for community and/or educational activity	6
	D.	Parcel features exceptional scenic outlook	3
	E.	Parcel itself is a scenic view	4
		Section IV Total Points	
Section	**V**	**Forestry and Agriculture**	
	A.	Tracts of woodland with sufficient size, appropriate soils, and other attributes that support responsible forest management, including the production of forest products	3
	B.	Farmlands, open fields, or early successional habitats with prime soil and other attributes that support viable agriculture	5
		Section V Total Points	
Section	**VI**	**Parcel Size**	
	A.	Property is 10 to less than 20 acres	3
	B.	Property is 20 to less than 35 acres	4
	C.	Property is 35 to less than 50 acres	5
	D.	Property is more than 50 acres	6
		Section VI Total Points	
Section	**VII**	**Possible Unwanted Features**	
	A.	Hazardous materials	-15
	B.	Buildings or manmade structures that detract from conservation value	-6
	C.	Problematic lot configuration	-2
	D.	Problematic surrounding land use, incompatible with conservation value such as junkyard	-6
	E.	Parcel would cause excessive maintenance or management expense	-5
	F.	Existing easements detract from conservation value	-5
	G.	Invasive or non native plant species present	-5
		Section VII Total Points	
		Total Points	

Comments, Summary, Signatures

Map and lot number:_____ Date of Field Survey:_____

Location in relation to nearby roads:

How the site came to be selected for observation:

Prominent conservation characteristics:

Distinctive species and unusual features:

Conservation features that need further investigation:

Summarize the site's conservation characteristics:

Names (print) _____ _____ _____

Signatures _____ _____ _____